

Synopsis of the SILLAGINOIDS.

BY THEODORE GILL.

Family SILLAGINOIDE Richardson.

*Synonymy.*Sillaginidæ *Richardson*, Report of 15th Meeting B. A. A. S., 1846, p. 223.Gobioides part. *Cuvier*, Regne Animal, ed. i.Percoides part. *Cuvier*.Sillagoidei *Bleeker*.Sciæuoidei (Sillaginiformes) part. *Bleeker*.Trachinoidæ part. *Günther*.

The body is elongated and little compressed, highest under the first dorsal fin, and thence nearly uniformly and slowly attenuated towards the caudal peduncle, which is moderately slender. Scales of moderate or small size; their external margins are generally rounded and pectinated. Lateral line simple, with a slight sigmoidal flexure and continued to the base of the caudal fin, or even slightly between its median rays. Head oblong or elongated, conical in profile, gradually decreasing in width above to the horizontally rounded snout, and nearly plane below. Forehead flattened or little convex. Eyes submedian. Nostrils double, approximated and in front of the eyes. Suborbital bones not articulated with the preoperculum. Preorbital bone very large, expanded over the side in front of eye, and entirely concealing the ends of the maxillary bones. A ridge is continued obliquely from the posterior suborbitals on the preorbital. Preoperculum much longer than high, with a prominent longitudinal fold, which, above the inferior horizontal border especially, is separated by a deep channel from the incurved portion which forms the inferior flattened surface of the head. Operculum short and thin. Interoperculum and suboperculum normally developed. Operculum with a slight crest ending in a spine. Mouth small and terminal; the periphery of each jaw more or less semi-elliptical. Intermaxillary bones little protractile downwards, with their ascending and marginal branches nearly equally developed. Supramaxillaries widest at their free ends and forming part of the arcade of the mouth. Teeth on the jaws and the front of the vomer. Branchiostegal membrane free, extending under the throat, but emarginated behind, and concealed under the opercular apparatus. Branchiostegal rays six on each side. Pseudobranchiæ present. Dorsal fins two; the first short; the second elongated and equal to or little larger than the anal, with which it is coterminous. Anal fin with two (or one) small spines. Caudal fin emarginated, with its lobes rounded. Pectoral fins normally inserted on the humeral cincture, with the lower rays branched. Ventral fins thoracic, with one spine and five branched rays. The fins have few or no scales.

The skull is convex below, and has muciferous cavities like that of a Sciænoïd. The pubic bones are well developed and separated from each other before by a sinus between the pedicles, by which they are suspended to the coracoid bones. There are thirty-four to forty-three vertebrae, of which twelve to sixteen are costiferous. The stomach is caecal; the pyloric caeca few (2-5).

The air bladder is simple. The ovaries are generally united nearly in a single mass.

This family is distinguished from all others by the combination of an elongated body, and elongated and nearly equal second dorsal and anal fins, with an oblong or elongated cavernous head, whose preorbital bones are very large, and whose preoperculum is bent inwards below, covering the inferior surface of the head, while a crest or fold separated by a deep groove assumes the aspect of the usual inferior margin.

It manifests more or less resemblance to several families, but its true relationship is rather difficult to be decided.

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By its cavernous skull, it suggests the Sciænoids and the *Acerinæ* among the Percoids, but from both, it is at once separated by the long anal fin which is nearly equal to the dorsal, and by other morphological and anatomical characters, which the description of the family given above will at once suggest.

Among the Percoids, it most resembles the species usually known under the name of *Acerina schraitzer*,* but as will be readily learned on comparison, the resemblance is simply analogical.

Among the Sciænoids, the most analogous forms appear to be the genera *Pachypops* of Gill, and *Pachyurus* of Agassiz, or *Lepipterus* of Cuvier. The squamation of the fins, characteristic of the Sciænoids, in addition to the shortness of the anal fin of those genera, and the peculiarly dense squamation of the caudal fin of *Pachyurus*, evidently show that they are true Sciænoids and exclude the entertainment of any strict or close affinity to the Sillaginoids.

From the Trachinoids and the allied forms with which the family has been associated by Dr. Günther, it is at once separated by the form and structure of the head.

Originally referred by Cuvier to the family of Gobioides, it was subsequently transferred to the division of the Percoides with thoracic ventrals, less than seven branchiostegal rays, and provided with two dorsal fins. The only other genus referred to that section was *Trichodon*.

Sir John Richardson, in his Report on the Fishes of the Chinese and Japanese waters, framed for it a new family, but subsequently placed it in his family of Uranoscopidæ.

Dr. Bleeker also, at one time, appears to have regarded the family as valid, and named it Sillagoidei. In his recent classification, he has removed it to the family of Sciænoids, and thus arranged it:

Familia 84. SCIÆNOIDEI—SCLÆNINI Bp.

Subfamilia 1. ACERINÆFORMES.

Gen. ACERINA Cuv., COPTODON Gervais.

Subfamilia 2. SILLAGINIFORMES.

Gen. SILLAGO Cuv., SILLAGINICHTHYS Blkr., ASPRO Cuv.

Subfamilia 3. SCIÆNIFORMES.

Gen. All Sciænoids of Günther, except Conodon and Eleginus, the former of which is a Pristipomatoid and the latter a Nototheniid.

The characters which distinguish the Sillaginoidæ from the Sciænoidæ have been previously enumerated. The differences existing between them and *Aspro* are still more decided. As previously remarked, the resemblance to *Acerina* is much greater. The genus *Coptodon* is not at all related to *Acerina*, but is a synonyme of *Tilapia*, the type of which is closely allied, if not identical with the *Chromis niloticus* of Cuvier.†

SILLAGO, Cuv.

Synonymy.

Sillago Cuv., Regne Animal, ed. i., vol. ii., p. 258, 1817.

" Cuv. et Val., Histoire Naturelle des Poissons, vol. iii., p. 398.

*The *Acerina schraitzer* appears to be the type of a distinct genus, to which the name of *Leptoperca* may be given. The genus differs from the restricted *Acerina* by the more slender body and head, and longer dorsal and anal fins.

†The name of *Chromis* cannot be retained for the *C. niloticus*, as the type of that genus is the *Sparuschromis* of Linné, (see Mem. du Museum d'Hist. Nat., tome i., p. 353, 355.) The name of *Tilapia*, though proposed by Sir Andrew Smith, under an erroneous view of its affinities, may be then accepted. The reference by Gervais of a species of the genus to *Acerina*, as was originally the case, is, to use the mildest expression, singular.

Atherina sp. *Forspalls*.

Platycephalus sp. *Bloch, Schneider*.

Sciæna sp. *Bloch, Schneider*.

Diagnosis.—Dentes velutini. Pinna dorsalis prima spinis 11 (12); secunda et analis subæquales. Squamæ mediocres, serie longitudinali 50—90.

Body elongated and slightly compressed, rounded and widest on the back, and more or less plane below. Scales on the side of moderate size, (50—90.) Head elongated-conical, compressed, gradually and nearly uniformly narrowed to the snout, which is horizontally rounded; eyes moderate or large and submedian. Mouth small, the periphery of the jaws semi-oval; jaws subequal, or lower shortest. First dorsal fin decreasing in a straight or convex line from the front or anterior rays, and with eleven, rarely twelve, spines. Anal fin with two slender spines, nearly equal to the second dorsal in extent and number of rays. (D. I. 17—23, A. II. 15—23.) Caudal fins emarginated. Ventral fins with the spine sometimes cartilaginous.

Type. *Sillago sihama*, *Rüppell*.

Syn.—*Sillago acuta* *Cuv*.

Sillago is now restricted to the species having similar forms, scales of moderate size and nearly equal dorsal and anal fins; and it consequently excludes some species that have been referred to it by previous naturalists, the *Sillago punctatus* being taken as the type of one, and *S. domina* as that of another genus. Even in the genus as now restricted, there are more considerable variations than are often found in the same genus. While the ventral spine is slender, and, as usual, osseous in most species, it is in one thick and cartilaginous. Again, some species have cycloid scales in the cheek and forehead, while others have ctenoid. The preoperculum is almost entire in some, while in others it is ciliated. As these differences do not, however, appear to be supported by others, they perhaps can scarcely be regarded as generic, and the species so distinguished have been therefore retained in the same genus.

The following analytical table will exhibit the range of variation in the genus, but, perhaps, is artificial, and may not show the affinities of all.

I. Anal rays I.—II. 19—23.

A. Ventral spine slender and osseous.

a. Cheek and interocular scales cycloid.

b. Scales large, 50—55 along lateral line. *S. macrolepis*.

bb. Scales moderate, 70—75 along lateral line.

Rows above lateral line 4, D. XI., I., 20, 21, A. I.

II. 22, 23.

Body and fins immaculate.

S. sihama.

Body immaculate; second dorsal spotted.

S. malabarica.

Rows above lateral line 5, 6. D. XI. I. A. I. II.

19—21.

Body immaculate; dorsal spotted between rays. *S. bassensis*.

Back spotted. First dorsal brownish above, dotted below; second margined with brown, and with two longitudinal vittæ; caudal with three transverse orange vittæ.

S. maculata.

aa. Cheek and interocular scales ctenoid.

Scales of lateral line 70—75; above three rows.

S. japonica.

Scales of lateral line 82—86; above seven rows.

S. parvisquamis.

AA. Ventral spine thick and cartilaginous, united with the first ventral ray.

S. chondropus.

II. Anal rays II. 15, 16 (18 *Cuv. et. Val.*)

First dorsal marbled with blackish; second with four or or five rows of oblong spots.

S. ciliata.

The following enumeration gives the synonyms of each species, the work in which it was first described, and the habitat.

It is proper to remark that the *Sillago sihama* and *S. malabarica* have been united by Dr. Günther under the name of *S. sihama*, and that *S. bassensis* and *S. maculata* have been also regarded as identical, and described under the latter name. Dr. Günther may be correct in his views, but as he has given no reasons to support them, and as there are well marked differences between those forms, which are generally specific, we prefer, with previous naturalists, to retain them as distinct, until it is demonstrated that their variations are of less value in this group than in most others. Dr. Günther's descriptions are also as restrictive as those of others, that of *Sillago sihama* applying to the one here retained as such, and the one of *S. maculata* rather to *S. bassensis*.

1. SILLAGO MACROLEPIS, Bleeker.
Sillago macrolepis Bleeker, *Natuurkundig Tijdschrift voor Nederlandsch Indië*, vol. xvii. p. 166.
Habitat.—Seas of Batavia and Bali.
2. SILLAGO JAPONICA, Temminck et Schlegel.
Sillago Japonica Temm. and Schlegel, *Fauna Japonica Pisces*, p. 33, pl. x. fig. 1.
Habitat.—Japanese and Moluccan seas.
3. SILLAGO SIHAMA, Rüppell.
Atherina sihama Forskal, *Descriptiones Animalium*, &c., p. 70.
Platycephalus sihama Bloch, *Systema Ichthyologicæ*, Schneid. ed., p. 60.
Sillago sihama Rüppell, *Atlas zur der Reise im Nördl. Africa, Fische*, p. 9, taf. 3, fig. 1.
Sillago erythræa Cuv. et Val., *Hist. Nat. des Poissons*, tom. iii. p. 409.
Habitat.—Red Sea.
4. SILLAGO MALABARICA, Cantor.
Sciæna malabarica Bloch, *Systema Ichthyologicæ*, Schneid. ed., p. 81, pl. 19.
 Soring *Russell*, *Desc. and Fig. of Fishes of Coromandel*, tom. 113.
Sillago acuta Cuv. et Val., *Hist. Nat. des Poissons*, tom. iii. p. 400.
Habitat.—East Indian and Chinese seas.
5. SILLAGO MACULATA, Quoy and Gaimard.
Sillago maculata Quoy and Gaimard, *Voyage de Freycinet, Zoologie*, p. 261 pl. 53, fig. 2.
Habitat.—East Indian and Australian seas.
6. SILLAGO BASSENSIS, Cuv. et Val.
Sillago bassensis Cuv. et Val., *Hist. Nat. des Poissons*, tom. iii. p. 412.
Habitat.—Coasts of South Eastern Australia.
7. SILLAGO PARVISQUAMIS, Gill.
Habitat.—Japanese seas.
8. SILLAGO CHONDROPUS, Bleeker.
Sillago chondropus Bleeker, *Verhand. von bet Bataav. Genoots*, chap. deel. xxii. *Percoiden*, p. 61.
Habitat.—Molluscan and Japanese seas.
9. SILLAGO CILIATA, Cuv. et Val.
Sillago ciliata Cuv. et Val., *Hist. Nat. des Poissons*, tom. iii. p. 415.
Habitat.—Australian seas.

SILLAGINODES, Gill.

Synonymy.

Silago sp. Cuv. et Val., Günther.

Diagnosis.—Dentes velutini. Pinna dorsalis prima postice oblique recta vel

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decurvata, spinis 12; secunda p. anali majori, radiis I. 26. Squamæ minimæ, serie longitudinali 170 plus minusve.

Body elongated and scarcely compressed, with the back as well as the abdomen more or less rounded. Scales of the body very small, there being 170 in a longitudinal row in the typical species. Head elongated-conical, compressed, gradually and nearly uniformly decreasing in width to the snout; eyes moderate and submedian. Mouth small; the periphery of each jaw semi-oval; jaws subequal, or lower shortest. First dorsal fin declining from the anterior portion in a straight or convex line, and with twelve spines. Second dorsal longer, and with more rays than the anal (I. 26.) Anal fin with one slender spine, and about twenty-two branched rays. Caudal fin emarginated. Ventral fins with a slender spine.

Type. *Sillaginodes punctatus*, Gill.

The most apparent distinctive characters of this genus are the small size of the scales, and the inequality, in size and number of the rays, of the second dorsal and anal fins. Although the second dorsal fin of the typical *Sillagines* is sometimes longer than the anal fin, the number of its rays is always the same or nearly so, and only in the *Sillago ciliata* is the dorsal longer than the anal. One species is known.

SILLAGINODES PUNCTATUS, Gill.

Sillago punctata Cuv. et Val. Hist. Nat. des Poissons, tom. iii. p. 413.

Habitat.—Australia.

SILLAGINOPSIS, Gill.

Synonymy.

Sillago sp. Cuv. et Val., Günther.

Diagnosis.—Dentes velutini, serie externa majores. Piuna dorsalis anterior spinis 9, spina secunda elongata, postice oblique incurvata.

Body elongated and subcylindrical. Scales small. Head elongated, depressed and declining towards the snout in a nearly straight line; its width gradually becomes less towards the nostrils, and thence the snout is more attenuated and rounded at its end; eyes very small and placed in the anterior half of the head. Mouth small. Lower jaws shorter than the upper. Teeth of the jaws pluri-seral, larger in the external row. Spinous dorsal fin commencing above the pectorals, with nine rays, the second of which is much elongated; second dorsal elongated, with its height gradually decreasing. Anal fin shorter than the soft dorsal, and nearly co-terminal with it. Caudal fin emarginated. Ventral fins with a slender spine.

Type. *Sillaginopsis domina*, Gill.

Syn.—*Sillago domina* Cuv. et Val.

This genus is very distinct from either *Sillago* or *Sillaginodes*, and is distinguished from both by the depressed head, the small eyes, the larger outer row of teeth, and the form of its first dorsal fin.

A single species is known.

SILLAGINOPSIS DOMINA Gill.

Sillago domina Cuv. et Val. Hist. Nat. des Poissons, tom. iii, p. 415, pl. 69.

Habitat.—Bay of Bengal and East Indian Archipelago.

Description of a new species of SILLAGO.

SILLAGO PARVISQUAMIS Gill.

The body is slender and highest under the first dorsal fin, the height there equalling an eighth (12-100) of the total length; under the second, it gradually diminishes, and the height of the constricted caudal peduncle is only a twentieth (5-100). The greatest width nearly equals a tenth of the length; behind, it becomes regularly compressed to the caudal fin.

1861.]